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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, NW
Washington, D.C. 20554

RE: CC Docket No. 97-211

Dear Ms. Salas:

The attached paper titled "The Need For Facilities-Based Internet Backbone Competition" is hereby submitted for the record in the above referenced proceeding.

The paper, prepared by Robert C. Gibson, co-founder of Capital Area Internet Service, and submitted to the FCC in the Section 706 proceeding, discusses the evolution of the Internet from a relatively open and collegial enterprise to one characterized by concentration and control by a few major players.

The trends and developments examined by Mr. Gibson are at the core of the debate surrounding the proposed WorldCom-MCI merger. His presentation and discussion can help the Commission and staff understand, review, and assess the issues raised by parties to this proceeding.

Sincerely,

Samuel A. Simon

/attachment

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The Need For Facilities-Based Internet Backbone Competition

By: Robert C. Gibson

May 6, 1998

About the Author

In 1993, Mr. Gibson co-founded Capital Area Internet Service (CAIS) of McLean, Virginia. CAIS was one of the earlier "peer" networks at the principal Internet Network Access Point MAE EAST. He has over 20 years experience in the telecommunications and computer fields, and has worked in a consulting capacity with major telecommunications companies such as MCI, Cable & Wireless, and AT&T. His knowledge and understanding of routers and key parts of the Internet is the basis for this document. Mr. Gibson has also served in the past as a consultant to both Bell Atlantic and Issue Dynamics Inc. on matters related to the Internet. In 1978, he received a Bachelor of Science in Business Administration with a Minor in Computer Science from Frostburg State University in Frostburg, Maryland.

Executive Summary

This paper has been prepared in response to petitions from the regional Bell operating companies (Bell Atlantic, US WEST and Ameritech) under Section 706 of the Telecommunications Act. Those petitions seek regulatory authority from the FCC to deploy Internet backbone.

The Internet of today suffers from a concentration of control of Internet facilities and insufficient geographic distribution of those facilities. The result is an anti-competitive environment where national Internet Service Providers (ISPs) control a majority of the Network Access Points (NAPs). This concentration of control has produced a hierarchy among the ISPs, with the large national ISPs at the top of the pyramid, using their market power to drive the mid-sized and smaller ISPs out of business.

History

The early years of the Internet, under the management of the National Science Foundation (NSF), were characterized by sharing, bound together in part by technical necessity. When the decision was made to commercialize the Internet, NSF sold the backbone facilities to various private companies.

After the demise of NSF, and it's support for the Internet backbone, the existing ISPs needed new ways to connect with each other. The ultimate solution was the creation of the Network Access Point (NAP). The NAPs served as interconnection points for the ISPs interested in exchanging packets of data across each other's networks. The exchange of data or "peering" was an efficient way MFS DATANET networks to pass packets across the Internet from one area of the country to another. MFS DATANET (now part of WorldCom) was appointed the as the administrator of the first major NAP known as MAE EAST. MFS DATANET was chosen as administrator because it was seen as a neutral third party.

MFS Buys UUNET

In these early days, ISPs like UUNET were known for their open peering policies - they were willing to peer with anyone. In 1996, when MFS WorldCom purchased UUNET, this policy began to change. The impact of MFS WorldCom's purchase of UUNET was felt in several ways. First, MFS had previously been seen as a neutral player regarding peering, now that MFS WorldCom owned an ISP the company suddenly had a vested interest in how traffic was exchanged at NAPs like MAE East (where they served as administrator). Secondly, UUNET slowly began to change its open peering policy, requesting that ISPs interested in peering sign non-disclosure agreements, where in may cases payment for peering was requested. And third, as the large ISPs grew larger, they were able to establish more control and market power, creating a caste system with large ISPs at the top and mid-sized and smaller ISPs at the bottom.

The Impact of Consolidation of Internet Facilities

The large ISPs (MCI, Sprint, and WorldCom) have established policies whereby they peer directly with each other, bypassing the NAPs. The mid-sized and small ISPs are given two choices: they can either peer at the NAPs (where the large ISPs may or may not have a presence) or they can pay the large ISPs for direct peering. Paying for peering guarantees a good connection, but is very costly. Peering at the NAPs is less costly, but the NAPs are often congested, and result in a degraded level of service. Many of the larger ISPs are choosing not to exchange traffic at the NAPs at all, forcing smaller providers to peer with third parties in order to carry traffic cross-country.

Conclusions

WorldCom, Sprint and MCI (the large national ISPs) are now all charging for peering. Current indicators suggest that the Internet is moving towards greater consolidation of ownership. This consolidation is resulting in a few large ISPs being able to dictate the cost of doing business, the level of access and the quality of service for all of the other players or potential players. The geographic distribution of the NAPs and backbone leaves many areas undeserved – for both ISPs and customers located there. At present, there is no investor in Internet facilities significant enough to provide the price and geographic competition needed to restore a healthy marketplace for backbone capacity and the NAPs.

By allowing large, willing investors such as the petitioning regional Bell companies into the backbone business, the FCC can help to break the stranglehold that the large ISPs have on network access. Authority to become regional providers of backbone service will benefit customers throughout their region with high-speed, high quality access to the Internet. The regional backbones will greatly improve the affordable, routing diversity options ISPs need to improve up-time and packet throughput.

In order to correct the dangerous trend toward consolidation that has been set for the Internet, a course correction is needed. This course correction can best be achieved through the establishment of the following policies:

- Equal treatment of backbone providers.
- More NAPs with publicly available standards, low barriers to entry, and multiple different technical solutions.
- NAPs should be built where multiple carriers have significant facilities.
- NAPs should not be allowed to place restrictions on what carriers may provide service to the NAP.
- NAPs should be geographically dispersed, and located in reliable, safe, secure locations.
- The cost structure to provision a connection to the NAP should be as low as technically possible.

- NAPs should be located so that they are close to undersea cable landings.
- NAP ownership and administration should be completely removed from ISPs.
- NAPs should have incentives for growth and for meeting the needs of NAP customers and the Internet as a whole.
- Routing structures should be managed so that local packets are routed locally.
- Peering should be provided and encouraged for genuine educational and non-profit organizations if technically possible. Much of the Internet was developed with US taxpayer dollars as well as huge development funding from educational institutions.

I. Introduction

This paper has been prepared in response to petitions from regional Bell operating companies (Bell Atlantic, USWEST, and Ameritech) under Section 706 of the Telecommunications Act. Those petitions seek regulatory authority from the FCC to deploy regional Internet backbone, i.e. broadband packet-switched InterLATA data services. Those companies also seek regulatory forbearance under section 706 for the deployment of xDSL features that will speed end-user customers' local access to ISPs. This paper deals with the Internet backbone issues and their bearing on improving the quality of Internet service available to both the end-user customer and the ISPs who would benefit from regional backbone options that strong, new competitors could provide.

One of the premises in the petitioners' submissions is that there is a systemic shortage of capacity in the Internet that is the result of growing concentration among integrated backbone facility providers. Skeptics argue that fiber backbone capacity in the US is rapidly becoming a commodity and that any shortage in bandwidth is a temporary phenomenon. There is a shortage of Internet backbone in many areas but not in the major cities. The real problem facing the Internet and its customers is a concentration of control of Internet facilities and the insufficient geographic distribution of those facilities. This paper outlines clear immediate benefits associated with granting the petitioners' requests for authority to make backbone facilities available.

The Internet, once driven by technological standards, is in the midst of a fundamental shift to a structure driven by financial and commercial incentives. With this shift in incentives has come many fundamental changes in the areas of access, ownership, service and cost.

There no longer exists one Internet where packets are exchanged freely. While the larger Internet Service Providers (ISPs) exchange traffic with each other, they have made it much more difficult for the mid-size and smaller ISPs to participate in the trading of packets with those larger providers. In essence, the large ISPs have made it extremely difficult for smaller ISPs to compete, both in terms of price and quality of service. Not only do the large ISPs own a majority of the backbone; they also control the largest Network Access Points (NAPs) where most of the smaller providers exchange traffic. The mid-sized and smaller ISPs are often faced with two options: pay the large ISPs for direct connections to their national networks, or take their chances on the congested NAPs to exchange packets. If they pay the high fees to the large ISPs to connect to the backbone via the NAP, it is hard to remain competitive. If they rely on the NAPs, they have little control over the quality of service they provide their customers. As a result, mid-size and smaller ISPs facing these choices are finding it increasingly difficult to operate their businesses. This is a dangerous trend and clearly not the direction the Internet should be heading in.

By allowing large, and willing investors, such as the petitioners, into the backbone business the FCC can help to break the stranglehold that the large ISPs have on network access. With authority to provide regional backbone service, the petitioners will benefit customers throughout their region with high-speed, high quality access to the Internet. The availability of massive amounts of regional backbone from these new and independent competitors will drive down peering prices and increase transit. Regional backbone providers will increase the number of affordable routing options ISPs need in order to improve up-time and packet throughput (i.e. the speed that the customers enjoy).

By supporting this major improvement in the cost and availability of regional facilities, the FCC will foster marketplace remedies that encourage more ISPs to enter the market and force those already in it to improve the level of service they offer customers. InterLATA backbone authority, as sought in the petitions, will also lead to marketplace solutions to remedy many of the NAP problems caused by the largest ISPs' dominance of the NAPs and other major Internet connection points.

The granting of authority is the best way to reverse the current trend towards consolidation and control of the Internet by a handful of large ISPs who own both the backbone and the principal NAPs where the smaller players exchange traffic.

II. Background

The Internet is by definition a network of networks. Each portion of the Internet is managed independently and no central control exists. In its origin, concepts of sharing, equality and efficiency characterized the Internet. A public set of fiber "backbones" was interconnected (peered) with a growing number of information providers. However, the Internet of today has ceased to be a level playing field where everyone is able to equally exchange packets and has instead become a hierarchical system. Indeed, three different and "unequal" Internets are emerging – partitioned by quality differences, with membership assigned by competitive rivals and without recourse to meaningful appeal.

The three Internets that are developing are as follows:

(1) Large National Integrated Providers. The largest Internet Service Providers, such as WorldCom, MCI, and Sprint have built or purchased their own Internet backbones and are also service providers. Together the three providers control or own nearly 70% of the national backbone capacity. Increasingly, these mega-providers are interconnecting directly with each other rather than through public access. Yet, they own or run most of the major NAPs and are managing the quality and service of the public peering points in a way that serves their own interests.

(2) Mid-sized ISPs. These ISPs often are national in character, but do not own any significant backbone facilities. Thus, they must depend on the major NAPs to connect their networks to the larger ISPs and other national providers. The quality of service provided at the NAPs owned by the large ISPs is lower than the quality of the private network ISPs use to carry their own traffic. The large ISPs own the largest NAPs, but rely for the most part on direct packet exchange with other large ISPs. As a result, they have not made sufficient investment in the NAPs to keep pace technically with the growth of the Internet.

(3) Resellers. These ISPs makeup the majority of existing providers in the United States. They are connected to the Internet principally through wholesale connection to either the large ISPs or other national providers. The quality of their service and interconnection is based on the terms and conditions granted by the large ISPs and mid-sized ISPs and the prices charged by them.

The confluence of Internet backbone ownership and control is creating an anti-competitive environment, which could potentially only get worse in light of the proposed WorldCom/MCI merger. All but the largest, and most financially capable ISPs, have little chance of surviving in today's marketplace. If the industry is to thrive, more facilities based competition for backbone service is needed, not less. Approving the petitions to build backbone for the transport of data between local service areas would be an important step toward facilitating this competition.

III. A Short History of the Internet

The transformation of the Internet from a voluntary, collaborative system into a commercial enterprise has created somewhat of a paradox. Early participants, largely government organizations and academic institutions, had common interests in increased connectivity, improved technology and higher speeds. Cost, capacity and even quality were not an issue in the early days of the Internet. Today, in the world of the commercial Internet, the participants are competitive and must be concerned with all of these issues.

The early years of the Internet were characterized by sharing, bound together in part by technical necessity. Software tools that made up the building blocks of the Internet included the e-mail programs[1], the computer languages[2], and the various services where no one entity was dominant. Network topologies were developed in cooperation with the other networks within the Internet. Informal, and some formal, conferences such as the "North American Network Operator Group" (NANOG) and the "Internet Engineering Task Force" (IETF) were held to tackle engineering issues in a mutually acceptable manner.

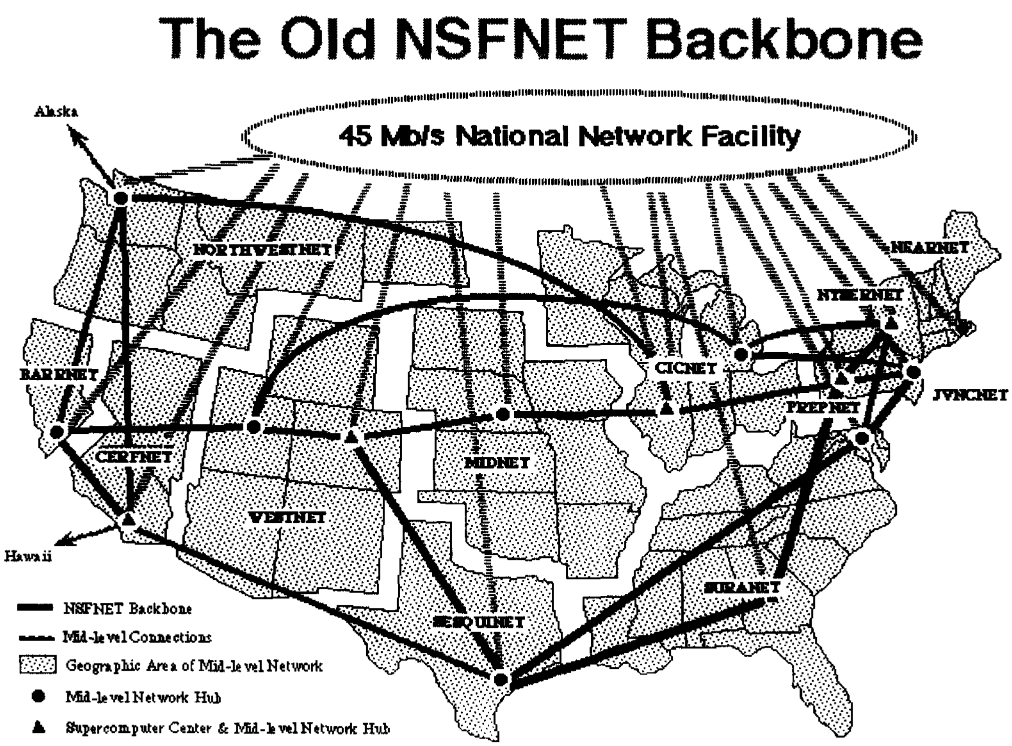
NSF: Early Founder

The earliest high-speed networks that formed the Internet were started by the Department of Defense as part of its effort to network research institutions around the country. Jurisdiction over the development of the Internet was later assumed by the National Science Foundation (NSF).

[1] Sendmail was not "free" it was distributed without charge. It was developed to help email travel efficiently on the Internet.
[2] These languages include HTML, the computer markup language of the World Wide Web, and DNS.

Until early 1995, the US government via the National Science Foundation (NSF) financed the development and maintenance of the NSF backbone (NSFnet).

The NSFnet served to bootstrap the collection of networks we now refer to as the Internet. The Internet consisted of a growing number of organizations with computers that wanted to inter-connect their computers[3] with each other and with others computers and networks by hooking into the NSFnet backbone. Once an entity applied for and was granted a



[3] Computers connected become a network. Thus, the interconnection of computers to the backbone allowed various local, regional and national networks.

"Network Announcement Change Request" (NACR) from the NSF, that entity was then permitted to access the NSF backbone. Once such a network could route (pass data packets) via the NSFnet, it was accessible virtually anywhere on the Internet.

The decision to commercialize the Internet meant that the administration of critical aspects of the Internet would be controlled. NSF sold backbone facilities to various private companies. At this time there were also a number of separate private networks, including CompuServe and America Online, that previously had not been inter-connected with the Internet, but which were beginning to let their users send and receive mail over the Internet through dedicated gateways.

To effect this transition, the Commercial Internet Exchange (CIX), a non-profit association with office space co-located with UUNET in Falls Church, was formed to enable its members to interconnect. It initially setup a large Cisco router in California that was available to route and exchange packets among all its members. Each member's network could provision a high-speed circuit to this router that would perform route announcements with any other network that wished and was able to connect.

Birth of the Network Access Point

After the demise of the NSF's support of the Internet backbone, the existing ISPs needed new ways to connect with each other. The CIX was an attempt to satisfy commercial connectivity outside of the NSFnet. The CIX worked for those large networks capable of connecting directly with the router in California; however, the other ISPs needed a way to connect with the CIX and with each other. The solution to achieving the needed connectivity was the creation of the Network Access Point (NAP). Intended only as a starting point for interconnection, NAPs perceived as logical, scalable and cost effective solutions for direct interconnections between each of the networks within the Internet.

In 1993, the NSF designated Metropolitan Area Internet- East (MAE EAST), located in Northern Virginia, as the Washington, D.C. NAP. UUNET selected MFS DATANET (now part of WorldCom) to serve as the administrator of MAE EAST. MFS DATANET was chosen because it supported a bridged Ethernet that could be logically shared around the Washington, D.C. area. MFS DATANET was considered an essentially disinterested third party in regard to peering, making it the perfect administrator. This approach was primarily a cost saving arrangement to reduce the number of expensive router ports needed on each of the ISPs routers. This was the beginning of peering at MAE EAST and later MAE WEST collectively, known as the MAEs.

"Peering" is the industry term used to describe the way one network "announces" to its peers what part of the Internet handles its packets. It was generally understood that connecting two networks improved connectivity. The more connections a network had to other networks, the fewer the bottlenecks, and the more places for packets to travel between the networks.

MAE EAST was known by many as a "tree house with no ladders." If an ISP was at MAE EAST, peering was not a problem. ISPs did not publish criteria for establishing peering and as a result, a start-up ISP wishing to peer at MAE EAST, was unable to do so. The restricted peering at MAE EAST, in effect, limited a provider's ability to operate and compete. Anyone could buy a connection to MAE EAST- it was knowing how to peer that was the problem.

For a period of time, all or most of the packets on the Internet were passed via MAE EAST (then located in a parking garage in Tyson's Corner, Virginia) resulting in a vast number of packets traveling to and from remote areas across the country and internationally. It soon became clear that a more efficient way to pass packets was to have regional ISPs exchange packets at local NAPs. As more NAPs became operational, more peering sessions were established outside of MAE EAST. The more peering sessions that were setup, the more paths between networks could be established. With more path options NAPs became less important because ISPs could peer in different locations.

The geographic locations of the NAPs are very important. The original concept was to have NAPs located near potential Internet "customers" this would keep the distance packets had to travel as short as possible. The current NAP locations are convenient to the NAP owners, but are not convenient for most ISPs or their customers. In the Northeast, for example, the nearest NSF sanctioned NAP is located in Pennsauken, New Jersey, hundreds of miles from population centers such as Boston or New York. Every ISP needs to be able to route its packets to every other network on the Internet. The more peering sessions, the more robust the Internet becomes. Peering relations are described as "bilateral" although there is no single factor used to compare one network to another or to determine equity. Any attempt to segregate or assign lower status to packets would be inefficient. For example, if Network A does not have peering with Network B, the path the packets need to take depends on a third Network C that does have peering directly with Network A and Network B (See diagram on page 17). In this case, there is a potential of doubling the number of times the same packets are passed along the same NAP. In another example, if Network A does not have peering with Network B, the path the packets need to take depends on a third Network C that does have peering directly with Network A, but has indirect peering with Network B through Network D. In this case, there is a potential of tripling the number of times the same packets are passed along the same NAP.

The benefits of peering are obvious, and very rarely would there be an ***efficient*** reason NOT to peer.[4] The reasons for peering and the lack of good reasons not to peer are important to understanding recent changes in peering relationships. (See diagram page 17,"Network Peering")

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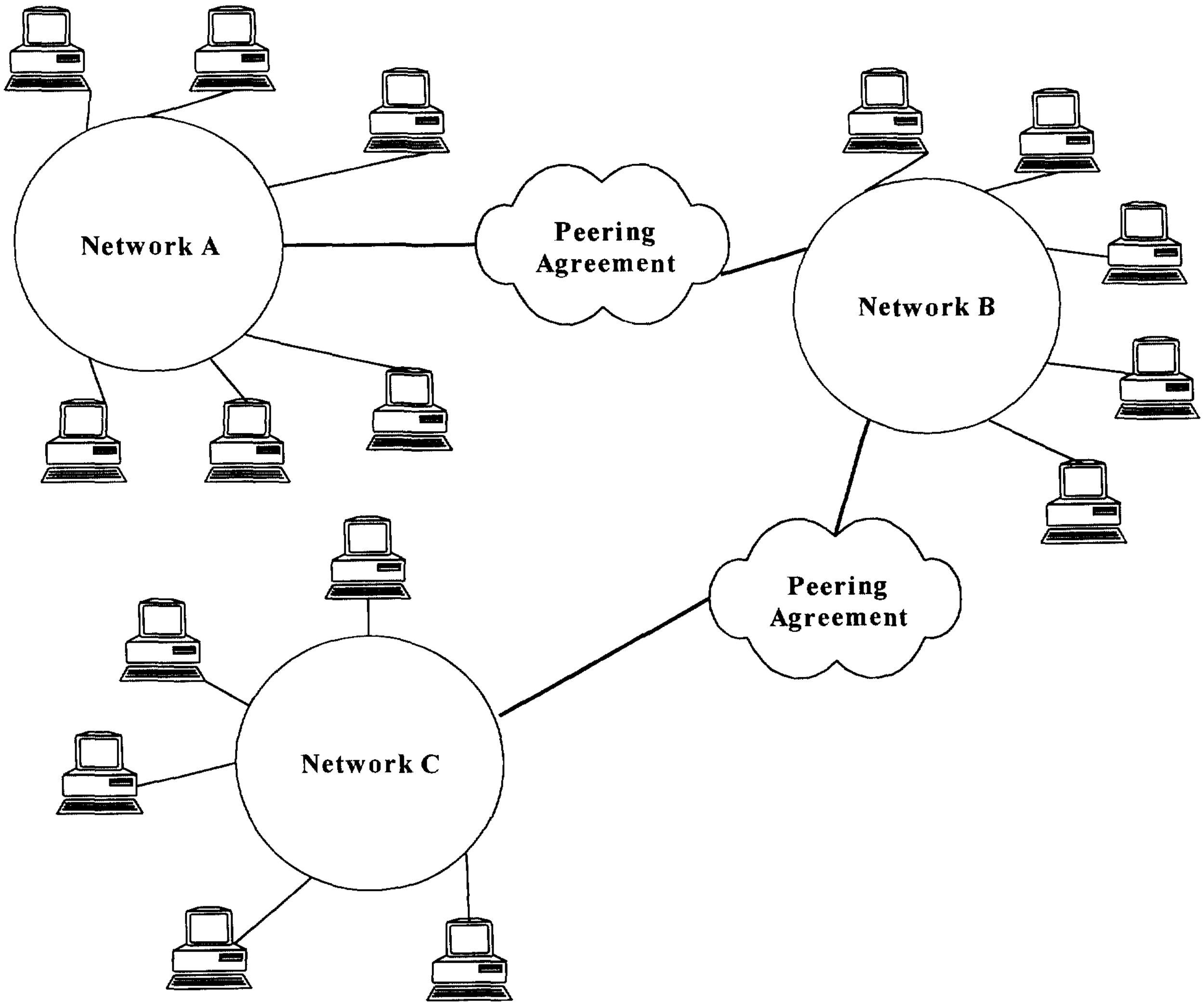
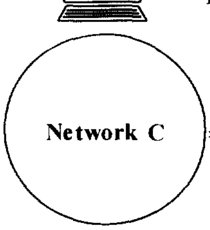
[4] In order to be technically sufficient for the purpose of peering, a provider would be required to provide a 24-hour, 7 day a week Network Operation Center with technically qualified engineer. There is no technical basis for one ISP to refuse peering with another ISP. The only reasons to stop peering with a technically sound ISP would be to make a profit through charging for peering, or to secure a competitive advantage.

Network Peering



LEGEND


= End User or Reseller of Network (ISP) Services



= ISP Highspeed connection (backbone)

=Peering agreement could include privatre network connection, MAE connection or other NAP connection point.

IV. A Watershed in the Short History of the Internet:

MFS Buys UUNET

In 1996, the neutrality of MAE EAST was forever lost when MFS purchased UUNET, one of the largest and most ambitious ISPs in the world. The reasons for the UUNET purchase as stated by UUNET are found on its web site:

> UUNET Technologies, Inc., merged with MFS in August 1996 to create one of the world's premier business communications companies. The combined company is the only Internet Service Provider to own or control fiber optic local loop, inter-city and undersea facilities in the United States as well as the United Kingdom, France and Germany. UUNET was founded in 1987 and continues to operate under the UUNET name. It was the first company to offer Internet service commercially and is recognized today as the world's largest Internet Service Provider. Most of the UUNET's 22,000 customers require high-speed commercial-grade Internet connections to support their high volume and diverse services. The combination of MFS' international high-bandwidth network platform and UUNET's industry leadership as an ISP puts the Company in a strong position to benefit from the accelerating shift to Internet-based communications.[5]

The merger of MFS and UUNET served as a watershed because this new partnership resulted in the development of standards that have impacted the entire industry. When MFS purchased UUNET it signaled the end of MFS' neutrality as the administrator of the MAEs. Now the once neutral broker and disinterested party was focused on developing a strong market position for UUNET -- the upkeep of the MAEs was secondary.

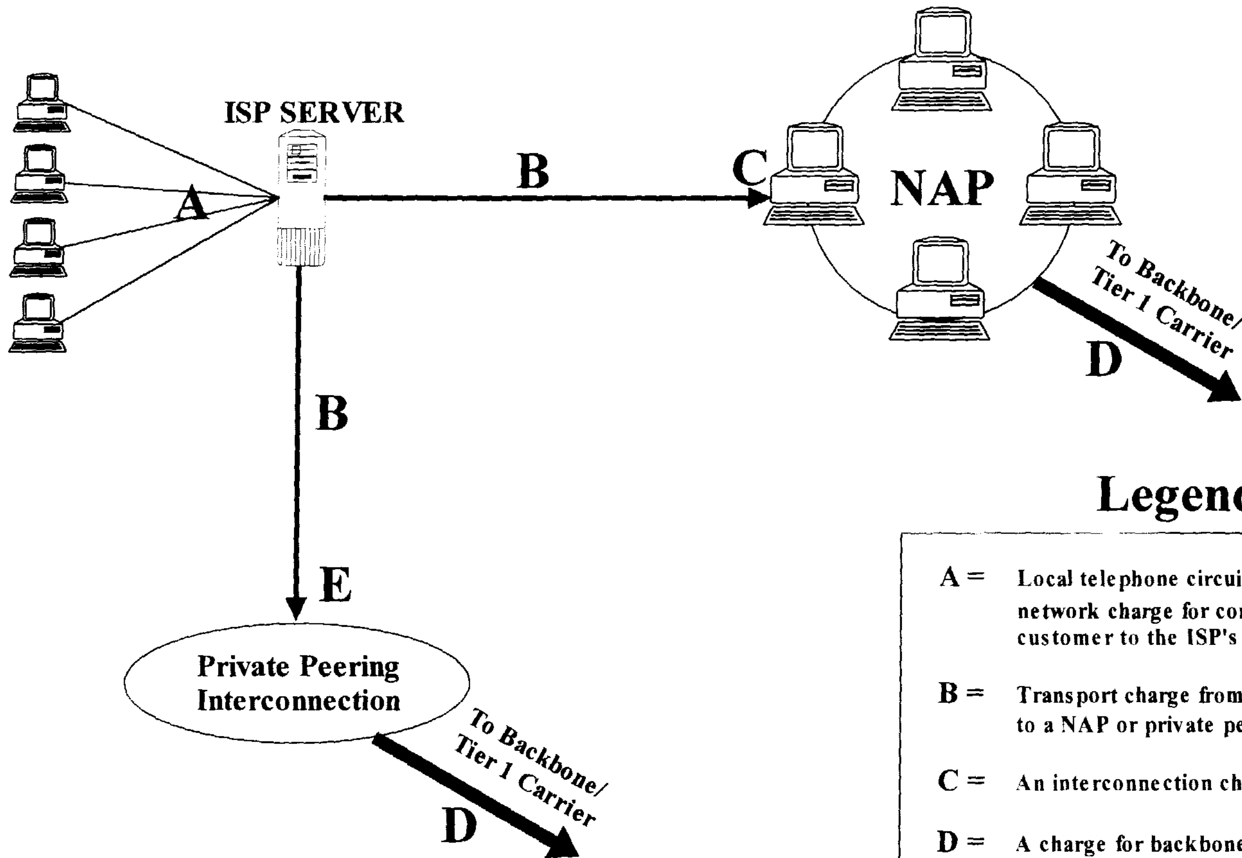
[5] MSF WorldCom, Inc. The 1996 MSF WorldCom Annual Report. Online. Internet. 1 May1998. Available: ttp://www.wcom.com/investor/wcomar1996/ar19962-6html

Prior to the purchase of UUNET by MFS, UUNET always had a reputation on the Internet as the ISP that would peer with everyone. After the purchase of UUNET by MFS changes in peering policy began taking place. UUNET began informally contacting customers regarding their peering relationships, and calling them in to negotiate new terms that would be signed under non-disclosure agreements. The standard of openness began to slowly disappear along and with it much of the efficiency as well as the relatively even-handed relationships that had allowed market entry based on ingenuity and modest capital.

Charging for peering has had a serious impact on the industry by fostering a hierarchical system that is making it harder for the mid-sized and smaller ISPs to stay competitive. Large ISPs are able to peer with other large ISPs at relatively no cost except for the cost of routers and circuits. Those ISPs that do not provide national service, or do not carry the same number of packets across their networks as the larger providers, most often exchange packets at the more public NAPs. The NAPs are public connection points where service is often slower due to limited capacity or lack of upkeep. Mid-sized [smaller ISPs by definition do not peer] ISPs can elect to either exchange packets at the NAPs or pay high fees to the large ISP's to connect directly to the large ISPs networks.

The way packets are carried across the network impacts both the cost to the ISP and the quality of service it is able to provide. There are 5 kinds of interconnection and transit costs (See diagram on page 20) that ISPs can face:

Transit and Interconnection Costs for Internet Service Providers



Legend

A =	Local telephone circuit or private network charge for connecting customer to the ISP's server
B =	Transport charge from the ISP server to a NAP or private peering point
C =	An interconnection charge at the NAP
D =	A charge for backbone transit from the NAP to destinations on the Internet
E =	Private peering arrangement involving charge for unequally sized ISPs

A) A local telephone circuit or private network charge for connecting the customer to the ISP's server.
B) A transport charge from the ISP server to a NAP or private peering point.
C) An interconnection charge at the NAP.
D) A charge for backbone transit from the NAP to destinations on the Internet.
E) A private peering arrangement involving a charge for unequally sized ISPs.

- For an ISP who relies on public NAPs transit and interconnection costs A-B-C-D would apply.
- For an ISP who relies on private peering transit and interconnection costs A-B-E would apply.
- For an ISP who uses both NAPs and private peering transit and interconnection costs all would apply.

V. ISPs: Three Tiers of Providers and the Impact on Competition

Within the Internet Service Provider industry there are three loose categories of service providers. These levels or categories are generally known as 1st, 2nd and 3rd Tier providers. There are no agreed upon exact industry definitions for each category and some providers may fit the definition of more than one level of service provider.

Large ISPs: 1st Tier

ISPs that have extensive Internet backbone capabilities and are connected to other 1st Tier providers at several locations across the United States are considered 1st Tier providers. These providers include MCI, Sprint, and MFS WorldCom. These ISPs would face costs for A-B-E as illustrated in the diagram on page 20. They would not include any of the regional Bell Companies, despite the fact that Ameritech and PAC Bell were involved in, and still maintain, two of the original MAE NAPs. This group is made up of large providers that have agreed to exchange packets with each other at no charge. In order to peer, ISPs must meet certain technical requirements including connecting at four distinct geographic locations with minimum bandwidth and packet level. If smaller providers are interested in the direct exchange of packets (not through the NAPs) they may or may not have to pay to peer (each provider has slightly different requirements for peering).

Mid-Sized ISPs: 2nd Tier

2nd Tier providers are typically regional providers that might connect at one NAP point or with one 1st Tier provider privately, but do not have a national presence. An example might be Erol's in the Northeast corridor. Erol's can haul packets locally but relies on other provider's backbone for transit across the country. A 2nd Tier provider has limited backbone infrastructure and depends on 1st Tier providers for relay of packets to areas not served by its own networks. Typically 2nd Tier providers would face costs for A-B-C-D in the diagram illustrated on page 20. In the areas where it has built backbone it may peer with 1st Tier providers, but outside of its network it relies on the purchase of transit from 1st Tier providers. This purchase of transit is expensive and degrades the 2nd Tier ISP's competitiveness.

Resellers: 3rd Tier

3rd Tier providers consist of those ISPs that resell another ISP's services. One example of a 3rd Tier provider is a Regional Bell Operating Company (RBOC) because it cannot transport data over legally prescribed service boundaries known as LATAs. They are strong regional providers, but also re-sellers of upstream ISP services. If 3rd Tier providers are forced into a position where they must always pay for transit, it will be difficult, if not impossible to be competitive on a long-term basis. This problem is not limited to those with restrictions, but also impacts all small start–up companies that five years ago were able to operate at a profit.

Network Congestion and Private Peering

As noted in the last section, the three-tier system has allowed the larger ISPs to exercise their market power, permitting direct peering with only similar size providers and charging for peering with smaller providers. UUNET and MCI both have made public statements with the FCC regarding their criteria for peering. Both UUNET and MCI have specific technical requirements for entering into peering arrangements with other ISPs that eliminate the possibility of a small ISP from peering directly with either of these large ISPs. In order to peer, ISPs must already peer at four distinct geographic locations; carry substantial packet levels; and have minimum bandwidth requirements.

These are the requirements both MCI and UUNET have in common. UUNET has two additional criteria listed in its North American Peering Policy:

- A candidate must enter into a Mutual Non-Disclosure Agreement and an Interconnect Agreement.
- UUNET reserves the right to not peer with an ISP at a public peering point (NAP including MAEs) ***if they are congested***.

The non-disclosure agreement obfuscates the true nature of UUNET's peering practices; therefore, there is no way of knowing the prices or costs to peer with UUNET.

By refusing to peer with ISPs at congested public peering points, WorldCom has set up a conundrum. UUNET's parent company, MFS WorldCom, is responsible for a significant portion of the congestion-taking place at the MAEs. By announcing that it will not peer at congested NAPs, it forces ISPs to enter into private network-to-network peering arrangements or purchase facilities in order to go to "non-congested" NAPs. There are clear anti-competitive implications for the Internet as long as this is the criteria for peering.[6]

Quality of service is also suffering under these new peering arrangements. The large ISPs own many of the NAPs and have not invested in the technology needed to address the rapidly increasing demand for bandwidth. For four years, they have continued to use the same technology (an FDDI switch), increasing the number of switches, but not upgrading the underlying technology. Simultaneously, the large ISPs are choosing to bypass the NAPs

[6] http://www.fcc.gov/Bureaus/Common_Carrier/Comments/MFS WorldCom/Mar20/232136.wp (MCI Public Peering Policy). http://www.fcc.gov/Bureaus/Common_Carrier/Comments/MFS WorldCom/Mar20/233668.wp (UUNET's Northern American Peering Policy)